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MAIN REQUEST

Claims

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1. A refrigerant composition which comprises:

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(i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane; trifluoromethoxy pentafluoroethane, 1,1,1,2,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 50% by weight based on the weight of the composition
(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition.

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with the remainder, not exceeding 60% by weight based on the weight of the composition, being:

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(iii) pentafluoroethane, trifluoromethoxy difluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.

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2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.

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3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

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4. A refrigerant composition which comprises:

(i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxy pentafluoroethane, 1,1,1,2,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 50 to 75% by weight based on the weight of the composition

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(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition; with the remainder being

(iii) pentafluoroethane, trifluoromethoxy difluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.

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5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

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6. A composition according to claim 4 or 5 wherein component (iii) is pentafluoroethane.

7. A refrigerant composition which comprises:

(i) 1,1,1,2- or 1,1,2,2-tetrafluoroethane, or a mixture of pentafluoroethane and 1,1,1,2- or 1,1,2,2-tetrafluoroethane, in an amount from 30 to 94% by weight based on the weight of the composition,

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(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,

(iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition with the provision that the concentration of pentafluoroethane in the composition is not 5 to 20% by weight based on

~~-the weight of the composition-~~

~~7.~~ A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.

~~5 8.~~ A composition according to claim ~~8~~ wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.

~~9 10.~~ A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.

~~10 11.~~ A composition according to any one of the preceding claims wherein component (ii) comprises a hydrocarbon which possesses 4 or 5 carbon atoms.

~~11 10.~~ A composition according to claim ~~11~~ wherein component (ii) comprises a hydrocarbon which is n-butane.

~~12 11.~~ A composition according to claim ~~12~~ which comprises:

- ~~20~~ (a) 46 to 46.5% by weight of pentafluoroethane
- (b) 50 % by weight of 1,1,1,2-tetrafluoroethane and
- (c) 4 to 3.5% by weight, respectively, of n-butane.

~~13 14.~~ Use as a refrigerant of a composition as claimed in any one of claims 1 to ~~15~~.

~~14 13.~~ Use according to claim ~~14~~ in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.

~~16. Use of a refrigeration composition which comprises:-~~

~~30~~ (i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 94% by weight based on the weight of the composition and

~~35~~ (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 10% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.

~~(iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.~~

~~17. Use according to claim 16 wherein the composition is as defined in claim 13.~~

~~40 15 16.~~ The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to ~~15~~ in the vicinity of a body to be cooled.

~~12 16.~~ A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to ~~15~~.

~~45 17 18.~~ A refrigeration apparatus according to claim ~~18~~ which is designed to use chlorodifluoromethane as refrigerant.

MAIN REQUEST

Claims

- 5 1. A refrigerant composition which comprises:
- (i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 50% by weight based on the weight of the composition,
- 10 (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,
- with the remainder, not exceeding 60% by weight based on the weight of the composition, being:
- 15 (iii) pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.
2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.
- 20 3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.
4. A refrigerant composition which comprises:
- 25 (i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 50 to 75% by weight based on the weight of the composition,
- 30 (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based

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on the weight of the composition,

with the remainder being:

(iii) pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.

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5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

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6. A composition according to claim 4 or 5 wherein component (iii) is pentafluoroethane.

7. A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.

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8. A composition according to claim 7 wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.

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9. A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.

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10. A composition according to any one of the preceding claims wherein component (ii) comprises a hydrocarbon which possesses 4 or 5 carbon atoms.

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11. A composition according to claim 10 wherein component (ii) comprises a hydrocarbon which is n-butane.

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12. A composition according to claim 11 which comprises:

- (a) 46 to 46.5% by weight of pentafluoroethane,
- (b) 50% by weight of 1,1,1,2-tetrafluoroethane and
- (c) 4 to 3.5% by weight, respectively, of n-butane.

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13. Use as a refrigerant of a composition as claimed in any one of claims 1 to 12.
14. Use according to claim 13 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.
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15. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to 12 in the vicinity of a body to be cooled.
16. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one
10 of claims 1 to 12.
17. A refrigeration apparatus according to claim 16 which is designed to use chlorodifluoromethane as refrigerant.